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WO 91/02313 A1
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(58) Field of Search

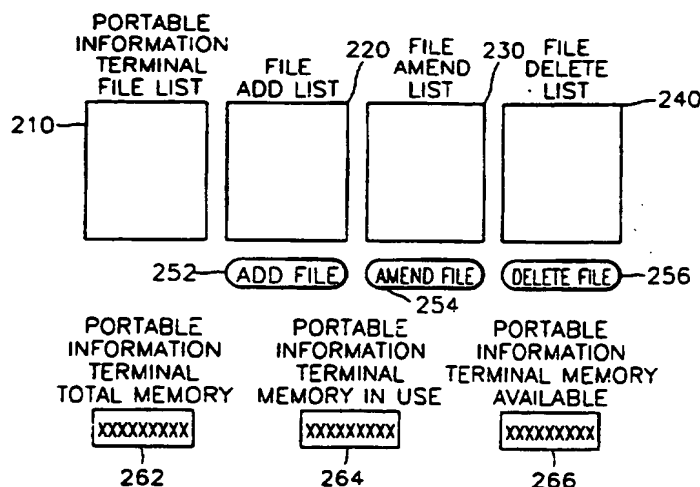
UK CL (Edition P) G4A AFGDT AFGN AFL
INT CL⁶ G06F 9/44 13/00 13/14 13/38
ONLINE: WPI INTERNET

(54) Abstract Title

A version management system

(57) A version management system is disclosed in which a portable information terminal (an electronic organiser, a lap-top or palm-held computer, a cellular telephone, a radio pager, or a wireless facsimile for example) has software remotely updated. The method includes the steps of i) generating a list of files to be changed, on a master server, ii) comparing the size of those files with the amount of available space on the portable device, and iii) maintaining and updating a record of the available portable device space on the master server whenever the modifying files are synchronised between server and remote client. The advantage is that user-intervention-free software upgrades can be made even in portable devices having limited memory and/or storage capability.

FIG. 2



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FIG. 1 (PRIOR ART)

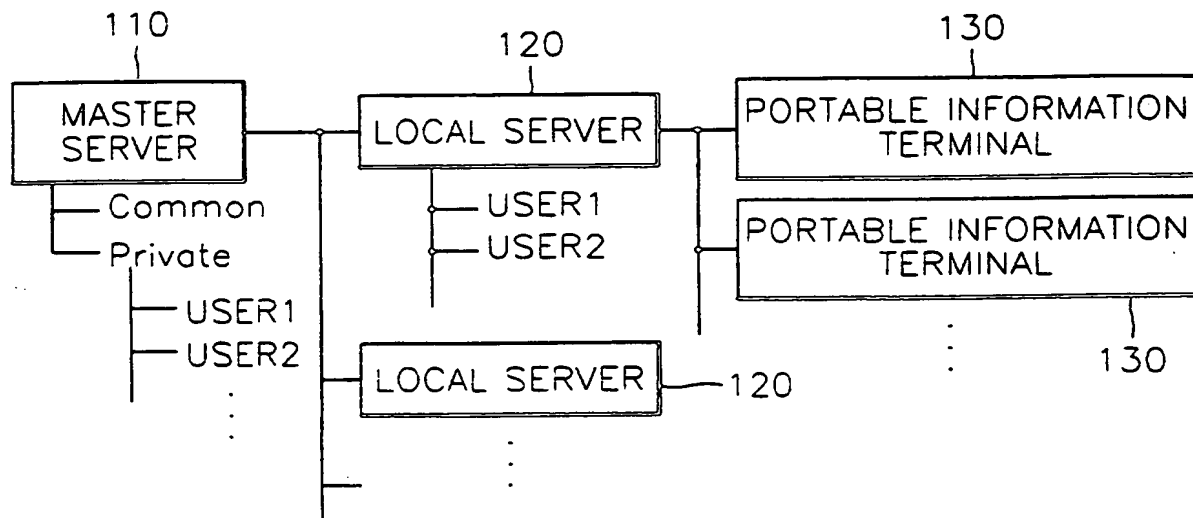


FIG. 2

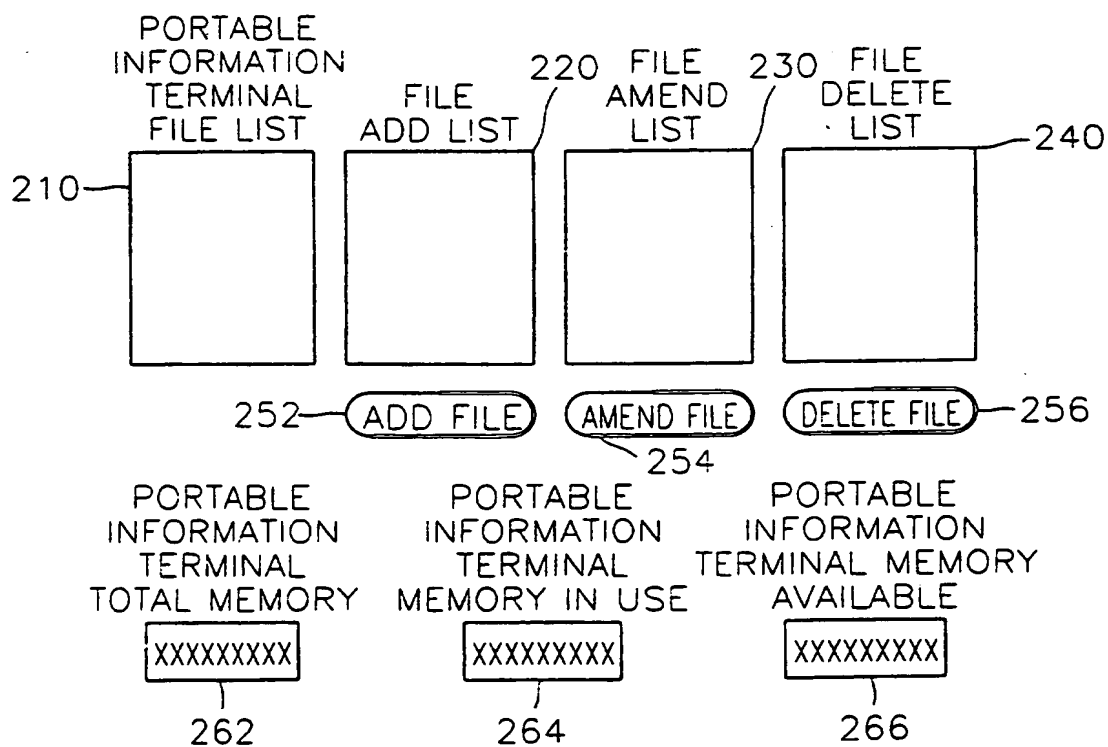


FIG. 3

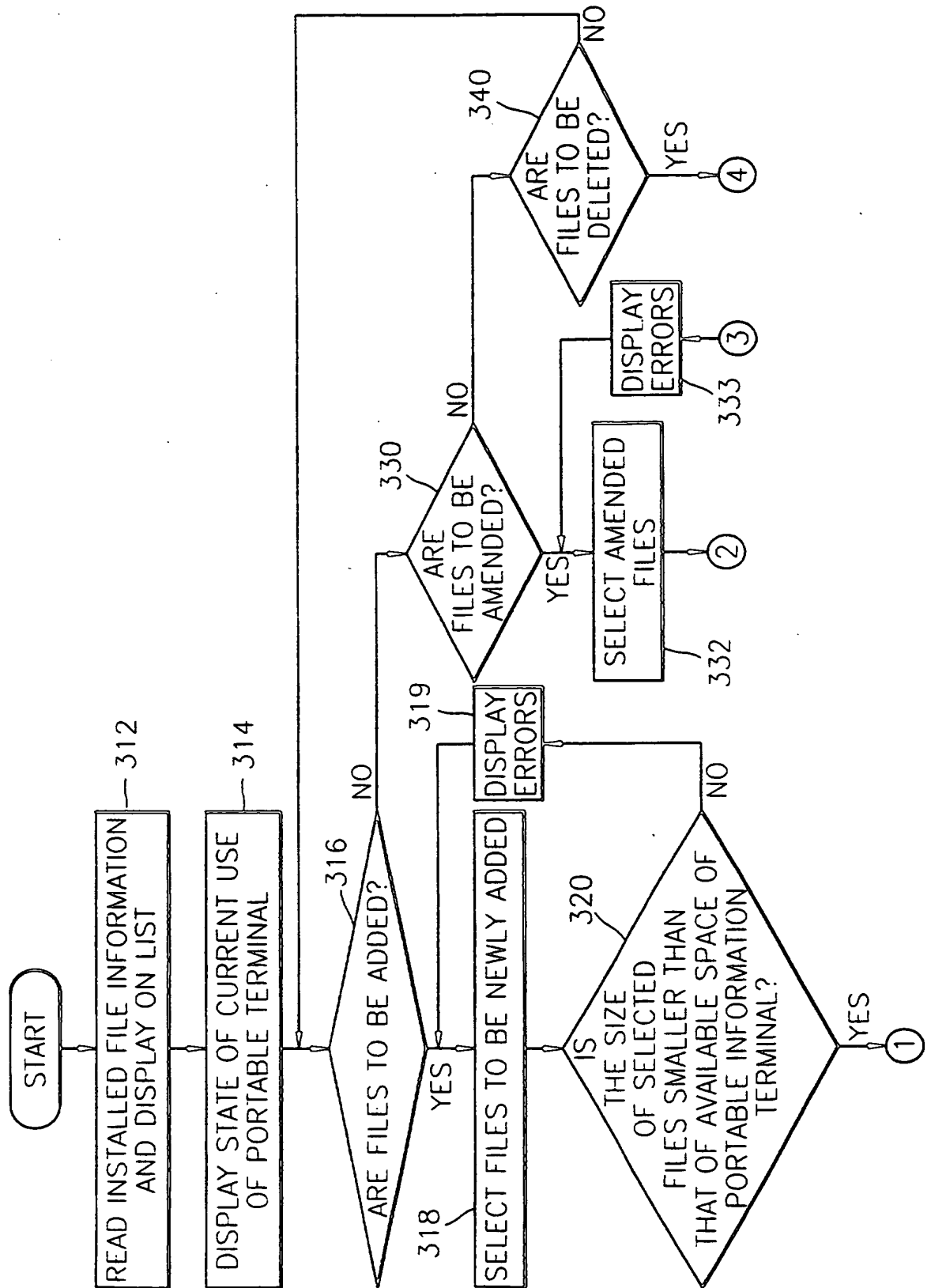


FIG. 3

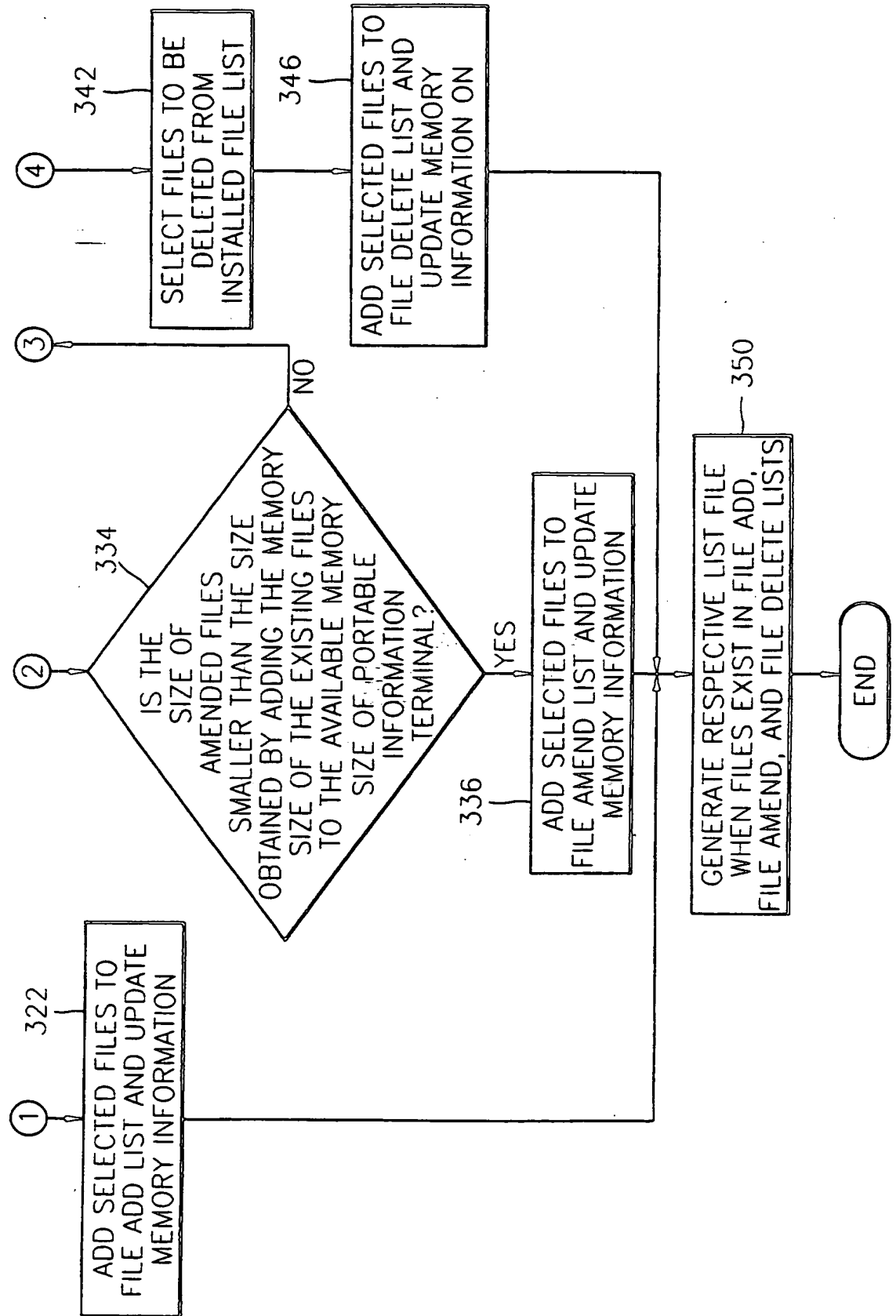


FIG. 4

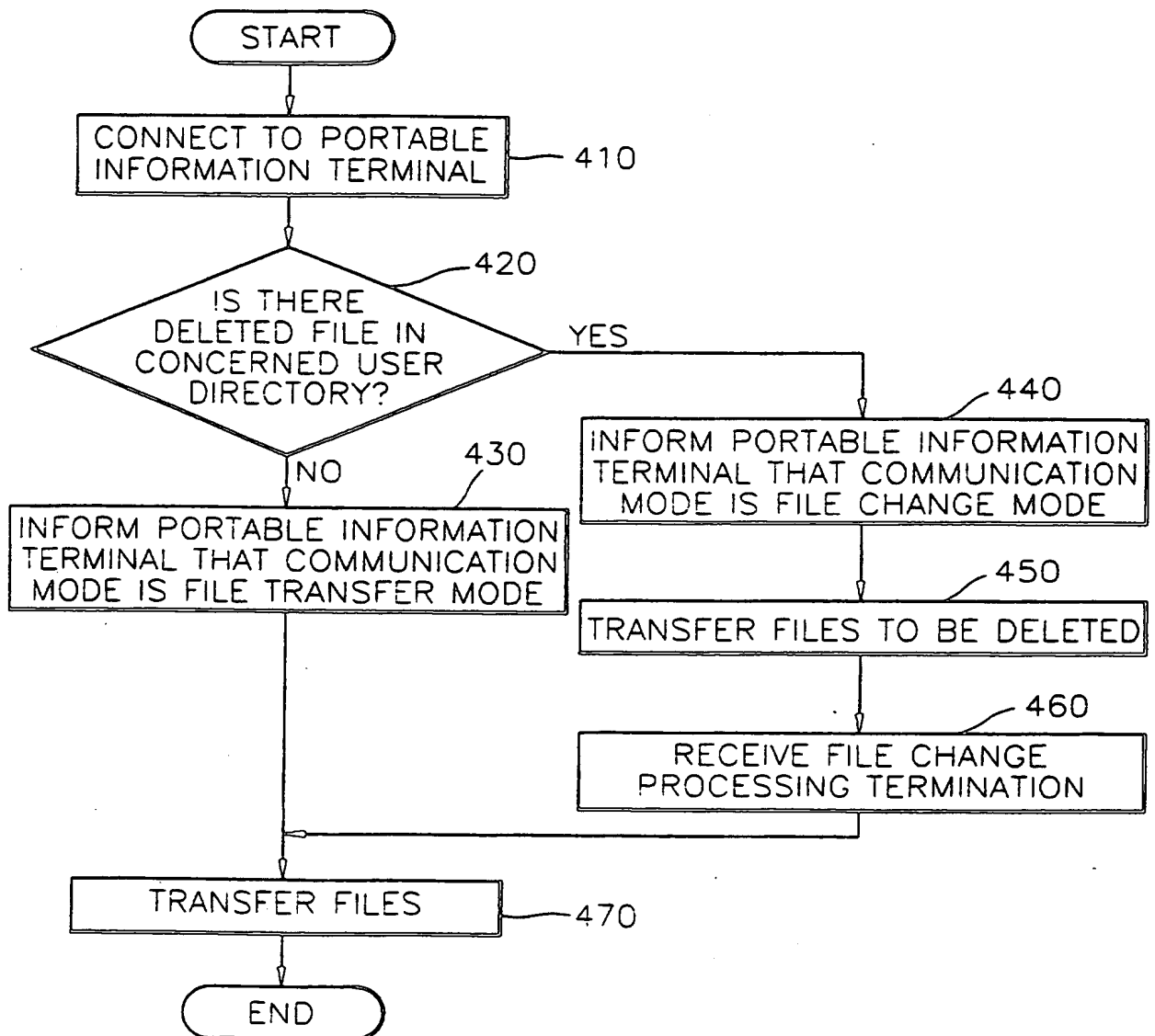
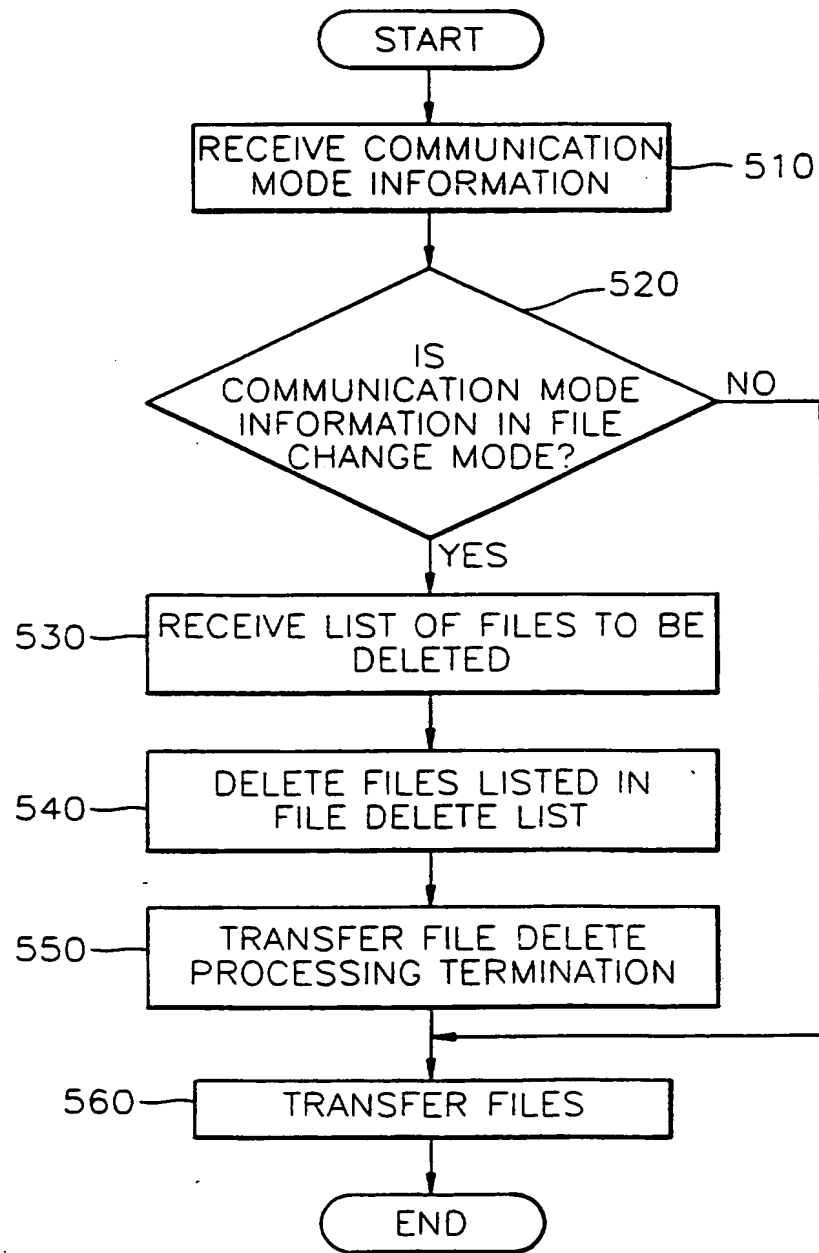


FIG. 5



- 1 -

METHOD OF MANAGING FILES OF PORTABLE INFORMATION TERMINAL

The present invention relates to a method of managing files in a portable information terminal, and more particularly, to a method of automatically upgrading a program installed in a portable information terminal to the most recent version.

In general, a portable information terminal is a multimedia product having functions of a cellular phone, a wireless facsimile, a radio pager, and an electronic organizer. It is possible to send document information to a master server and retrieve document information from the master server regardless of the time or location using the portable information terminal. Also, it is possible to detect and receive information of a data base connected to a personal computer (PC).

Figure 1 shows the structure of a general network comprised of servers and portable information terminals.

Files commonly used by all portable terminals are stored in a common directory of a master server 110. Personal files of individual users (i.e., user 1, user 2, etc) are stored in a private directory. Local servers receive common files and personal files of users from the master server 110, store them in the directories of the respective users (user 1, user 2, etc.) and transfer relevant files when the portable information terminals are connected.

When the files to be installed in the portable information terminal 130 are recorded in a directory (the private directory) of the master server 110, the respective local servers receive the files and transfer

them to the user directories. When the portable information terminals 130 are connected to the local servers 120, the users receive the files in the directories. Here, the files are transferred in a directory unit since they are related to each other. That is, the transfer of the files is completed when all the files in the directory are transferred. The files in the concerned directories are deleted after they are transferred. Therefore, the portable information terminal 130 needs temporary space for receiving files and receives files in the temporary space. However, the master server 110 cannot transfer program files to the portable information terminal 130 if the size of the program files is larger than the memory space remaining in the portable terminal 130 when a program is added or an existing program is amended.

It is an aim of embodiments of the present invention to provide a method of automatically upgrading an installed file to the most recent version without interacting with a user in a portable information terminal in which memory space is restricted when a file is added, amended, or deleted.

According to an aspect of the invention, there is provided a method of managing files of a portable information terminal, comprising the steps of (a) comparing the size of files to be changed with the size of available space of the portable information terminal, generating a file list to be changed, and updating information on the memory size of the portable information terminal in the master server when the files to be installed in the portable information terminal are changed in a state in which the master server is connected to the portable information terminal and (b) storing the file

list to be changed in the step (a) in a specific directory of the master server and transferring the file list to the portable information terminal when files are transferred.

5 Preferably, the changes to the files in the step (a) are adding, amending, and deleting of files.

 Preferably, files are added when the size of the files to be changed is smaller than memory available in
10 the portable information terminal in the step (a).

 Preferably, the step of displaying error messages when the size of the files to be changed is larger than the memory available in the portable information terminal.
15

 The files may be amended when the size of the files to be amended is smaller than the sum of the size of existing files and memory available in the portable information terminal.
20

 The method may include the step of calculating the change of memory information, displaying the calculated memory information on a screen, and generating a file list whenever files to be changed exist.
25

 Preferably, a file delete list is transmitted to the portable information terminal and the file list to be changed is transferred when files to be changed exist in the concerned directory of the master server in the step
30 of transferring the files to the portable information terminal.

 The portable information terminal may delete the files recorded on the file delete list received from the
35 master server and receives the files to be changed.

The above object and advantages of the present invention will become more apparent by describing in detail a preferred embodiment thereof with reference to the attached drawings in which:

5

Figure 1 shows the structure of a general network of servers and portable information terminals;

10 Figure 2 shows the structure of an interface screen in a master server for managing files to be installed in a portable information terminal according to an aspect of the present invention;

15 Figure 3 is a flowchart showing a method for managing files to be installed in the portable information terminal of Figure 2;

20 Figure 4 is a flowchart showing a method for transferring files from the master server to the portable terminal; and

25 Figure 5 is a flowchart showing the transfer of files from the portable information terminal to the master server.

25

Figure 2 shows the structure of an interface screen of a master server for managing files to be installed in a portable information terminal according to the present invention. The interface screen includes a portable information terminal file list display portion 210, a file add list display portion 220, a file amend list display portion 230, a file delete list display portion 240, a file add key 252, a file amend key 254, a file delete key 256, a portable information terminal total memory display portion 262, a portable information terminal memory in use

30

35

displaying portion 264, and a portable information terminal memory available display portion 266.

Figure 3 is a flowchart showing a method of managing
5 files to be installed in the portable information terminal
of Figure 2. The method includes the steps of reading
installed file information and displaying the read file
information list 312, displaying the current state of use
of the portable information terminal 314, adding files in
10 the portable information terminal 316, 318, 319, 320, and
322, amending files in the portable information terminal
330, 332, 333, 334, and 336, deleting files from the
portable information terminal 340, 342, and 346, and
generating files 350.

15

The master server adds new files, amends existing
files, and deletes unnecessary files within a range which
does not exceed the available space of the portable
information terminal when the files to be installed in the
20 portable information terminal are to be changed. The
information shown in Figure 2 can be displayed on the
screen of the master server or on an interface screen in
a keypad.

25 The files installed in a portable information
terminal are generally changed for the following three
cases. First, new files are to be installed in the
portable information terminal. At this time, the total
size of the files to be installed must be smaller than the
30 available space (a memory) of the portable information
terminal. Second, there are files to be amended among the
files installed in the portable information terminal. At
this time, the total size of the files to be amended must
be smaller than the size obtained by adding the memory
35 size of the existing files to the size of the available

space (the memory) of the portable information terminal. Third, in the case that the files installed in the portable information terminal are no longer necessary, the files are deleted in order to provide more empty
5 (available) space of the portable information terminal.

In order to realize the above functions, as shown in Figure 3, the master server connects to the portable information terminal, reads existing information of files
10 installed in the portable information terminal, and displays the file information in the portable information terminal file list display portion 210 (step 312). Also, the master server displays the total memory, the memory in use by the portable information terminal and the available
15 memory in the portable information terminal total memory display portion 262, the portable information terminal memory in use display portion 264 and the portable information terminal memory available display portion 266, respectively (step 314).

20

The master server continuously checks whether the file add key 252, the file amend key 254, and the file delete key 256 for selecting the change of files have been depressed and respectively performs a function
25 corresponding to the depressed key (steps 316, 330, and 340). Namely, whenever the user adds files, amends files, or deletes files, the master server compares the size of the memory of the portable information terminal, displays information thereon, and displays error messages when the
30 available size is exceeded. First, when the file add key 252 is depressed (step 316), the master server selects files after operation of a dialog box which allows selection of files to be newly added (step 318). Here, the master server adds the selected files to a file add
35 list and updates the information on the size of the memory

of the portable information terminal (step 322) when the size of the memory of the selected files is smaller than the available space (the memory) of the portable information terminal (step 320). When the size of the memory of the selected files is larger than the available memory of the portable information terminal (step 320), an error message is displayed (step 319) and the process returns to the step 318. Then, the master server selects the files to be amended (step 332) after operation of the dialog box which can select the files to be amended when the file amend key 252 is depressed (step 330). When the size of the memory of the files to be amended is smaller than the size obtained by adding the memory size of the existing files to the available memory (displayed in the portable information terminal memory available display portion 266) of the portable information terminal (step 334), the master server adds the selected files to a file amend list and updates the information on the memory size of the portable information terminal (step 336). If memory space is exceeded, an error message is displayed on the screen and the process returns to the step 332 (step 333). When the file delete key 252 is depressed (step 340), the master server selects the files to be deleted from the installed file list (step 342), adds the deleted files to the file delete list, and amends the information on the memory size of the portable information terminal (step 346). Finally, when the added, amended, and deleted files are generated in the file add, file amend, and file delete lists by the steps 322, 336, and 346, the master server stores the file list to be changed in the user directory (step 350). The portable information terminal deletes files recorded on a file delete list and receives files to be upgraded when a file list to be changed is received from the master server.

Figure 4 is a flowchart showing a method for transferring files from the master server to the portable information terminal.

5 As shown in Figure 4, the master server connects to
the portable information terminal (step 410). When the
deleted list of files does not exist in the concerned user
directory (step 420), the master server informs the
portable information terminal that a communication mode is
10 a file transfer mode (step 430) and transfers the files to
be installed (step 470). When the deleted file list file
exists in the user directory, the master server informs
the portable information terminal that the communication
mode is a file change mode (step 440) and transfers the
15 concerned deleted list of files (step 450). Here, the
master server automatically transfers files to be
installed (step 470) when a file change processing
termination is received from the portable information
terminal (step 460).

20

Figure 5 is a flowchart for transferring files from the portable information terminal to the master server

25 As shown in Figure 5, the portable information
terminal receives a communication mode information (a file
transfer mode or a file change mode) from the master
server (step 510). Here, the portable information
terminal receives the deleted list of files (step 530),
deletes the concerned files (step 540), transfers the file
30 delete processing termination to the master server (step
550), and transfers the files to the master server (step
560) when the communication mode is a file change mode
(step 520). Also, the portable information terminal
transfers files to the master server (step 560) when the

communication mode is not in a file change mode (step 520).

5 As mentioned above, according to the present invention, it is possible to easily manage files of the portable information terminal by solving the shortage of space problem which occurs during the transfer of the files by collectively managing the files to be installed in the portable information terminal in the master server.

END

CLAIMS

1. A method of managing files of a portable information terminal, comprising the steps of:

5 (a) comparing the size of files to be changed with the size of available space of the portable information terminal, generating a file list to be changed, and updating information on the memory size of the portable information terminal in the master server when the files
10 to be installed in the portable information terminal are changed in a state in which the master server is connected to the portable information terminal; and

 (b) storing the file list to be changed in the step
15 (a) in a specific directory of the master server and transferring the file list to the portable information terminal when files are transferred.

2. The method of claim 1, wherein the changes to the
20 files in the step (a) are adding, amending, and deleting of files.

3. The method of claim 1 or 2, wherein files are added when the size of the files to be changed is smaller than
25 memory available in the portable information terminal in the step (a).

4. The method of claim 1, 2 or 3, further comprising the step of displaying error messages when the size of the
30 files to be changed is larger than the memory available in the portable information terminal.

5. The method of any preceding claim, wherein the files are amended when the size of the files to be amended is

smaller than the sum of the size of existing files and memory available in the portable information terminal.

- 5 6. The method of any preceding claim, further comprising the step of calculating the change of memory information, displaying the calculated memory information on a screen, and generating a file list whenever files to be changed exist.
- 10 7. The method of any preceding claim, wherein a file delete list is transmitted to the portable information terminal and the file list to be changed is transferred when files to be changed exist in the concerned directory of the master server in the step of transferring the files
- 15 to the portable information terminal.
8. The method of any preceding claim, wherein the portable information terminal deletes the files recorded on the file delete list received from the master server
- 20 and receives the files to be changed.
9. A method of managing files substantially as herein described with reference to Figures 2 to 5 of the accompanying drawings.

25



Application No: GB 9806899.2
Claims searched: 1 to 9

Examiner: Grant Bedford
Date of search: 23 September 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.P): G4A (AFGDT AFGN AFL)
Int Cl (Ed.6): G06F (9/44 13/00 13/14 13/38)
Other: Online: WPI INTERNET

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X,P	EP 0773503 A2 (TOSHIBA) See whole document.	1 to 9
X	WO 96/32679 A1 (HIGHWAYMASTER) See whole document.	1 to 9
X	WO 94/25923 A1 (NOVADIGM) See whole document.	1 to 9
X	WO 91/02313 A1 (IBM) See whole document.	1 to 9
X	Derwent Acc. No. 98-165079 & J10031590, (TOSHIBA)	1 to 9

X Document indicating lack of novelty or inventive step
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